



CHAPTER 8 Summary

SECTION 1 How Populations Change in Size	OBJECTIVES	KEY TERMS
	<ul style="list-style-type: none">• Each population has specific properties, including size, density, and pattern of dispersion.• When a population has few limits on its growth, it may undergo exponential growth. This is the fastest possible growth rate of the population.• When a population has few limits to its growth, it may have an exponential growth rate. Usually, population growth is limited by factors such as disease and competition.• Carrying capacity is the maximum population a habitat can support over a long period of time.• Populations may be subject to density-dependent regulation.	<p>population density</p> <p>dispersion</p> <p>growth rate</p> <p>reproductive potential</p> <p>exponential growth</p> <p>carrying capacity</p>
SECTION 2 How Species Interact with Each Other	OBJECTIVES	KEY TERMS
	<ul style="list-style-type: none">• The niche of an organism is its requirements for survival and/or its feeding relationships.• Interactions between species are categorized based on the relative benefit or harm that one species causes the other. The categories are competition, predation, parasitism, mutualism, and commensalism.• Competition between species occurs when their niches overlap. The competition may be direct or indirect.• Pairs of species that have close relationships often evolve adaptations in response to one another.	<p>niche</p> <p>competition</p> <p>predation</p> <p>parasitism</p> <p>mutualism</p> <p>commensalism</p> <p>symbiosis</p>

(t) ©Norman Tomalin/Bruce Coleman, Inc./Photoshot; (b) ©Tierbild Okapia/Photo Researchers, Inc.

CHAPTER 8 Review

Reviewing Key Terms

Use each of the following terms in a separate sentence.

1. *reproductive potential*
2. *carrying capacity*
3. *competition*
4. *symbiosis*

For each pair of terms, explain how the meanings of the terms differ.

5. *niche* and *habitat*
6. *predator* and *prey*
7. *predation* and *parasitism*
8. *mutualism* and *commensalism*
9. Use the following terms to create a concept map: *symbiosis, predation, predator, prey, parasitism, parasite, host, mutualism, and commensalism.*

Reviewing Main Ideas

10. In which of the following pairs do both organisms belong to the same population?
 - a. a rose and a carnation
 - b. a zebra and a horse
 - c. two residents of New York City
 - d. two similar species of monkeys
11. A population of some species is most likely to grow exponentially
 - a. if the species is already very common in the area.
 - b. when the species moves into a new area of suitable habitat.
 - c. when it uses the same habitat as a similar species.
 - d. if the population size is already large.
12. A population will most likely deplete the resources of its environment if the population
 - a. grows beyond carrying capacity.
 - b. must share resources with many other species.
 - c. moves frequently from one habitat to another.
 - d. has a low reproductive potential.
13. The growth rate of a population of geese will probably increase within a year if
 - a. more birds die than are hatched.
 - b. several females begin laying eggs at younger ages than their mothers did.
 - c. most females lay two eggs instead of three during a nesting season.
 - d. some birds get lost during migration.
14. Which of the following is an example of competition between species?
 - a. two species of insects feeding on the same rare plant
 - b. a bobcat hunting a mouse
 - c. a lichen, which is an alga, and a fungus living as a single organism
 - d. a tick living on a dog
15. Which of the following statements about parasitism is true?
 - a. The presence of a parasite does not affect the host.
 - b. Parasitism is a cooperative relationship between two species.
 - c. Parasites always kill their hosts.
 - d. Parasites benefit while their hosts are harmed.
16. Ants and acacia trees have a mutualistic relationship because
 - a. they are both adapted to a humid climate.
 - b. they are part of the same ecosystem.
 - c. they benefit each other.
 - d. the ants eat parts of the acacia tree.
17. Which of the following is an example of coevolution?
 - a. flowers that can be pollinated by only one species of insect and insects adapted to use only that flower
 - b. rabbits that invade a new habitat
 - c. wolves that compete with each other for territory
 - d. bacteria that suddenly mutate in a lab

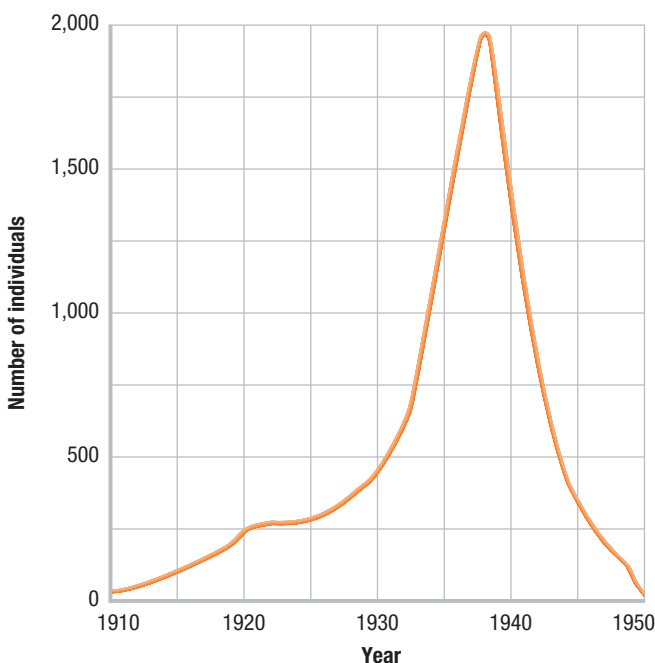
Short Answer

18. A tapeworm lives in the intestines of a cow and feeds by absorbing food that the cow is digesting. What kind of relationship is this? Explain your answer.
19. Explain how two species can compete for the same resource even if they never come in contact with each other.
20. Snail kites are predatory birds that feed only on snails. The kites use their hooked, needlelike beaks to pull snails from their shells. Explain how these specialized beaks might have evolved in these birds.
21. What would happen to the population of snail kites mentioned in question 20 if the snails' habitat was destroyed? Explain your answer.

Interpreting Graphics

The graph below shows the population of some reindeer that were introduced to an Alaskan island in 1910. Use the graph to answer questions 22–24.

22. Describe this population's changes over time.
23. What might have happened in 1937?
24. Is it possible to estimate the island's carrying capacity for reindeer? Explain your answer.



Critical Thinking

25. **Analyzing Relationships** Read the explanations of competition and predation. If one species becomes extinct, and then soon after, another species becomes extinct, was their relationship most likely competition or predation? Explain your answer.
26. **Evaluating Hypotheses** Scientists do not all agree on the specific carrying capacity of Earth for humans. Why might this carrying capacity be difficult to determine?
27. **Evaluating Conclusions** A scientist finds no evidence that any of the species in a particular community are competing and concludes that competition never played a role in the development of this community. Could this conclusion be valid? Write a paragraph to explain your answer.
28. **Health** Viruses are the cause of many infectious diseases, such as common colds, flu, and chickenpox. Viruses can be passed from one person to another in many different ways. Under what conditions do you think viral diseases will spread most rapidly between humans? What can be done to slow the spread of these viruses?
29. **Create a Habitat and Interaction Map** Create a visual representation of the habitat and interactions of an organism of your choice. Research the organism's habitat, behaviors, and interactions with other species. If possible, observe the organism (without disturbing it) for a day or more. Create a piece of art to show all of the interactions that this organism has with its environment.

Analyzing Data

Use the equation below to answer questions 30–31.



30. **Extending an Equation** The equation gives the change in a population over a given amount of time (for example, an increase of 100 individuals in one year). Use the two parts on the right side of the equation to write an inequality that would be true if the population were increasing. Rewrite the inequality for a decreasing population.
31. **Analyzing an Equation** Suppose you are studying the small town of Hill City, which had a population of 100 people in the first year of your study. One year later, 10 people have died, and only 9 mothers have given birth. Yet the population has increased to 101. How could this increase happen?

Making Connections

32. **Communicating Main Ideas** Why do population sizes not grow indefinitely?
33. **Creative Writing** Write a science fiction story about life without competition.
34. **Writing from Research** Find information in encyclopedias or natural history references about different kinds of mutualism. Summarize the similarities and differences between the various relationships. Focus on the ways in which each species benefits from the other species.

CASESTUDY

35. Both predators and prey use camouflage. Describe how they each use a similar adaptation in different ways.
36. Some adaptations of both predators and prey involve group behaviors. Describe an example of a prey animal using a group behavior. Also, describe an example of predators working together.

Why It Matters

37. Killer whales hunt and eat a variety of prey, not just sea lions. Research and describe three adaptations that make killer whales effective predators.



STUDYSKILL

Review with a Partner To review the main ideas of the text, try summarizing with a partner. Take turns reading a passage, and then try to summarize aloud what you have read. Try not to look back at the text. Then, discuss and review the text with your partner to check your understanding.